



## EFFECTS OF SOWING DATES AND NORMS ON GRAIN QUALITY OF SOYBEAN CULTIVARS

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Article history:	Abstract:
<b>Received:</b> 14 <sup>th</sup> June 2022	This paper presents data on the effect of different Sowing dates and norms on grain quality of soybean cultivars. Accordingly, in order to have a high amount of protein and oil content in soybean grain, it is considered appropriate to sow both varieties of soybean in the early period at the norm of 60 kg per hectare. Sowing 15 kg less per hectare (45 kg) than this acceptable rate will reduce protein content by 0.5-0.8%, oil content by 0.3-0.7%, and planting 15 kg more (75 kg) by 0.5-0.6 and 0.3-0.5% less respectively.
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### INTRODUCTION

Currently, in our country, a lot of attention is paid to grain, leguminous and oil crops, and the cultivated areas are being expanded. Great opportunities have been opened for the development of agriculture and efficient use of land. One of the most important problems today is the issue of protein, that is, meeting the human demand for protein. In solving this problem, the soy plant is of great importance from leguminous crops. Soybean contains 40-55% protein and 20-25% oil [2].

Protein is a high-molecular compound, the composition of which consists mainly of amino acids and nitrogen, carbon, oxygen, hydrogen and sulfur. Protein is the main component for the normal growth and development of the human body. Protein supply is mainly due to livestock and agricultural products.

The protein content of soybeans can range from 27% to 68%. According to the findings of the scientists, soy protein is notable for being the cheapest and most widespread among agricultural crops in the world.

Soybean oil is the second largest producer of vegetable oil in the world. Even cotton, sunflower, peanut and rapeseed oils are produced 10 times less. Soybean oil is a source of energy for the human body, it contains fat-soluble vitamins in metabolism, cellular system activity, and as a means of protecting human skin from external stresses [6; 7; 8].

Decision No. PR-3027 of the President of the Republic of Uzbekistan, Sh.M. Mirziyoev, dated June 1, 2017, "On the measures to place repeated crops in the areas freed from grain crops, to supply the material and technical resources required for planting in a timely manner" was adopted. In this decision, it is necessary for the president of the country to determine soybean cultivation areas based on the decision and to plant them as a repeated crop, to fully satisfy the needs of the population in the republic for food products,

especially vegetable oil, to provide the population with vegetable oil stably, to reduce the volume of imports, and to raise livestock and poultry. and in order to increase livestock and poultry products at the expense of providing valuable feed, development of selection and seed production, development of agrotechnologies for obtaining high and high-quality grain yield from soybeans, their introduction into production is required [3].

Soybean sowing norm is determined depending on the size of the seed and the quick ripening of the variety [1], [Tashkent "Mehnat" 1998 y].

Favorable periods of sowing are determined, ensuring favorable conditions of heat, moisture and air in the soil, planting, high yielding are important agrotechnical measures [2], [Samarkand "Zarafshon" 2004 y].

In the agriculture of Uzbekistan, the soybean plant is of great importance in maintaining and increasing soil fertility, rational use of irrigated lands in spring and summer, providing livestock with nutritious fodder and feed, growing protein-rich products for the population, and providing raw materials for light industry [4].

According to G. Tonchev and others, "The yield of leguminous crops and the amount of protein in their content depends on the nodules formed in the roots of leguminous crops" [5; 9; 10].

### MATERIALS AND METHODS

**Research place.** All observations of the research were carried out in the experimental field of the Scientific Research Institute of Rice, cultivation in the 12<sup>th</sup> card, check 4. Soil meadow-swamp, previous crop rice, plant type soybean "Sevinch" and "Madad" varieties.

The experimental field of the Rice Research Institute is located in the south-eastern part of the Tashkent region, in the Chirchik oasis, 15 km from the city of Tashkent.



**Research method .** In 2020, the field experiment was conducted in the experimental fields of the Scientific Research Institute of Rice and in the RSI laboratory on the soybean varieties "Sevinch" and "Madad".

**Agrotechnical activities.** The agrotechnical activities in the experimental areas were carried out on the basis of the recommendations for the cultivation of leguminous crops in Uzbekistan produced by the scientists of the institute, and the agrotechnical activities were carried out according to the rules. The experimental field 30 cm was plowed in autumn at 25 depth. In the spring, the land was chiseled, harrowed, and troweled. Quality cleaned and sorted seeds were planted. A crop rotation system was used, the predecessor crop being rice. Planting was carried out by hand in an alternate period. Irrigation work was done on time.

Soybean is cultivated 2 times to clean the plants from weeds. Fertilizers were sprayed and cultivation was done on time for each period. The harvest was collected on time, dried and delivered to the warehouse. Autumn plowing is done after harvesting the ground.

## **RESULTS AND DISCUSSION**

Soybean contains up to 20% oil on average, from which high-quality oil for human consumption and technical purposes is obtained during processing.

Based on the goals and tasks of the research, during the years of the research, the amount of protein and oil in both varieties of soybeans was determined in laboratory conditions.

According to the obtained data, it was determined that different soybean sowing dates and norms had an effect on the amount of protein and oil in them.

According to the data, when both varieties of soybeans are planted in the early period (25.04-30.04) at 60 kg per hectare, it is observed that the amount of protein and oil in them is high was 37.3% and 18.7% respectively in Sevinch variety (Table 1).

When these varieties are planted at the rate of 45 kg per hectare in the early period, the protein content is 38.1 and 36.7%, respectively, and the oil content is 19.1%; 18.3%, and when planting 75 kg per hectare; it was made 38.4 36.8%; 19.3; 18.4% in accordance.

When soybean varieties were planted in the middle period (05.05-10.05), the amount of protein

and oil in the grain was slightly lower than when planted in the early period. According to the data, when varieties are planted at 45 kg per hectare, the amount of protein and according to the varieties, oil is 37.6, 36.4 and 18.7; 18.0% respectively; when planting 60 kg per hectare; 38.1; 37.0 and 19.5; 18.5%, and when planted from 75 kg per hectare; 37.8; 36.4% and it was 18.2; 19.1%.

When the varieties were planted in the late period (15.05-20.05), the amount of protein and oil in the grain showed lower values compared to those planted in the early and middle periods. When varieties are planted at 45 kg per hectare, these indicators are respectively 37.2; 35.8% for varieties; and 18.5; 17.6%, when planting 60 kg per hectare; it was 37.7; 36.6% and 19.2; 18.1%, and when planted from 75 kg per hectare; It was observed 37.3; 36.1% and it was 18.8; 18.0%.

It can be concluded from the data obtained on the effect of planting dates on the amount of protein and oil in soybean varieties that when soybean varieties are planted 10 days later than the early period (25.04-30.05), the amount of protein in the "Madad" variety is from 0.5% to 0.8%, and the amount of oil is 0.2% to 0.4%, and when planted 20 days later, the protein content is 0.9% to 1.2%, and the oil content is 0.5% to 0.6%. In the "Sevinch" variety of soybeans, these indicators are 0.3% to 0.4% protein, 0.2% to 0.3% oil, and 0.7% up to 0.9% protein when 20 days late, and the oil content is less - from 0.4% to 0.7%.

When analyzing the information obtained on the planting norms of the varieties, it was found that the amount of protein and oil contained in soybeans is less compared to the variants planted with 60 kg per hectare, if the planting norms are low (45 kg) or very high (75 kg) in both varieties and in all planting periods. The amount of protein was 38.1%, and the oil content was 19.1% in option 1, where 45 kg per hectare was planted in the early term of the experiment "Madad", and in option 3, where 75 kg was planted per hectare, these indicators were 38.4; 19.3%, respectively. In option 2, which is planted at 60 kg per hectare, it is higher than these indicators, protein is 38.9%, oil is 19.8%, that is, compared to options 1 and 3, the amount of protein is by 0.8; 0.5%, oil content was found to be 0.7; 0.5% higher. The same regularity was observed in the variants of the experiment planted in the middle and late periods.



**Table 1**  
**Effect of sowing dates and norms on grain quality of soybean varieties**

Option №	Soybean varieties	Sowing dates	Sowing norms kg/ha, thousand pieces	The amount of oil in grain, %		The amount of protien in grain,%	
				2020 year	2021 year	2020 year	2021 year
1	Madad	25.04-30.04	45 (280)	19.1	18.4	38.1	36.5
2			60 (375)	19.8	18.7	38.9	36.8
3			75 (465)	19.3	18.5	38.4	36.7
4		05.05-10.05	45 (280)	18.7	18.2	37.6	36.3
5			60 (375)	19.5	18.5	38.1	36.5
6			75 (465)	19.1	18.1	37.8	36.3
7		15.05-20.05	45 (280)	18.5	18.0	37.2	36.0
8			60 (375)	19.2	18.3	37.7	36.3
9			75 (465)	18.8	18.1	37.3	36.1
10	Sevinch	25.04-30.04	45 (300)	18.3	18.1	36.7	36.1
11			60 (400)	18.7	18.4	37.3	36.4
12			75 (500)	18.4	18.2	36, 8	36.2
13		05.05-10.05	45 (300)	18.0	17.9	36.4	35.8
14			60 (400)	18.5	18.2	37.0	36.1
15			75 (500)	18.2	18.0	36.4	35.9
16		15.05-20.05	45 (300)	17.6	17.6	35.8	35.5
17			60 (400)	18.1	18.0	36.6	35.9
18			75 (500)	18.0	17.8	36.1	35.6

These legality are also observed in the versions of the experiment where the "Sevinch" variety is planted, and this variety is also 60 kg per hectare. The amount of protein and oil when planted at the rate of 45 kg and 75 kg per hectare was higher than that of the options planted at 75 kg per hectare. According to the received data, in the 10<sup>th</sup> variant, which planted 45 kg per hectare in the early period, the protein content was 36.7%, and the oil content was 18.3%, while in the 12<sup>th</sup> variant, which was planted at 75 kg per hectare, these indicators were respectively 36.8; 18.4%. In option 11, which is planted at 60 kg per hectare, it is higher than these indicators, protein is 37.3%, oil is 18.7%, that is, compared to options 10 and 12, the amount of protein is by 0.6; 0.5%, oil content was found to be higher by 0.4; 0.3 % (table 1).

### CONCLUSIONS

Therefore, it can be concluded from the obtained data that in order to have a high protein and oil content in soybean grain, it is advisable to plant both varieties of soybean in the early period at the rate of 60 kg per hectare. Planting 15 kg less per hectare (45 kg) than this acceptable rate will reduce protein content by 0.5-0.8%, oil content by 0.3-0.7%, and planting 15 kg more (75 kg) by 0,5-0.6% and 0.3-0.5% less,

respectively. In the 2021 year of the research, similar patterns were identified.

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